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RESTORATION OF CAMPTOSAURUS.

WITH PLATE VI.

By O. C. MARSH.

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THE Jurassic deposits of western North America contain the remains of many gigantic Dinosaurs, and various skeletons of these have been obtained by the writer, who has described the more important forms. Restorations of the skeletons of three of the most interesting genera, *Brontosaurus*, *Stegosaurus*, and *Ceratops*, have already been given in this Journal, and another of these huge reptiles is thus represented on Plate VI accompanying the present article. Each of the three forms previously restored was a typical member of a distinct group of the *Dinosauria*, and this is true, although in a less degree, of the present genus, *Camptosaurus*. Restorations of *Anchisaurus* from the Triassic, and *Claosaurus* and *Triceratops* from the Cretaceous, all Dinosaurs of much interest, have likewise been published by the writer in the present Journal.*

The restoration here given is based upon the type specimen of *Camptosaurus dispar*, one of the most characteristic forms of the great group *Ornithomimidae*, or bird-footed Dinosaurs. The reptile is represented on Plate VI, one-thirtieth natural size. The position chosen was determined after a careful study not only of the type specimen, but of several others, in excellent preservation, belonging to the same species or to others nearly allied. It is therefore believed to be a position frequently assumed by the animal during life, and thus, in some measure, characteristic of the genus *Camptosaurus*. The present species, when alive, was about twenty feet in length, and ten feet high in the position here represented.

The genus *Camptosaurus* is a near ally of *Iguanodon* of Europe, and may be considered its American representative. *Camptosaurus*, however, is a more generalized type, as might be expected from its lower geological horizon. It resembles more nearly some of the Jurassic forms in England generally referred to *Iguanodon*, but, as these are known only from fragmentary specimens their generic relations with *Camptosaurus* cannot now be determined with certainty.

In comparing *Camptosaurus*, as here restored, with a very perfect skeleton of *Iguanodon* from Belgium, as described and figured, various points of difference as well as of resemblance may be noticed. The skull of *Camptosaurus* had a sharp, pointed beak, evidently encased during life in a horny sheath. This was met below by a similar covering, which enclosed the premaxillary bone. The entire front of the upper and lower jaws was thus edentulous, as in *Iguanodon*, but of different shape. The teeth of the two genera are of similar

* This Journal, vol. xli, p. 339, April, 1891; vol. xlii, p. 179, August, 1891; vol. xliii, p. 313, October, 1892; and vol. xliii, p. 169, February, 1893.

form, and were implanted in like manner in the maxillary and dentary bones. In *Camptosaurus*, there is over each orbit a single supra-orbital bone, curving outward and backward, with a free extremity, as in the existing Monitor; a feature not before observed in any other Dinosaur except *Laosaurus*, an allied genus, also from the Jurassic of America. Other portions of the skull of *Camptosaurus* as well as the hyoid bones appear to agree in general with those of *Iguanodon*.

The vertebræ of *Camptosaurus* are similar in many respects to those of *Iguanodon*, but differ in some important features. In the posterior dorsal region, the transverse processes support both the head and tubercle of the rib, the head resting on a step, as in existing crocodiles. The five sacral vertebræ, moreover, are not ossified, even in adult forms, and to this character the name *Camptonotus* first given to the genus by the writer in 1879 especially refers.* Another notable feature of the sacral vertebræ of the type specimen should be mentioned. The vertebræ of the sacrum, especially the posterior four, are joined to each other by a peculiar peg and notch articulation. The floor of the neural canal of each vertebra is extended forward into a pointed process (somewhat like an odontoid process), which fits into a corresponding cavity of the centrum in front. This arrangement, while permitting some motion between the individual vertebræ, helps to hold them in place, thus compensating in a measure for absence of ankylosis. A similar method of articulation is seen in the dermal scales of some ganoid fishes, but, so far as the writer is aware, nothing of the kind has been observed before in the union of vertebræ.

In *Camptosaurus*, the sternum was entirely unossified, and no trace of clavicles has been found. The pelvis of *Camptosaurus* differs especially from that of *Iguanodon* in the pubis, the postpubic branch being even longer than the ischium, while, in *Iguanodon*, this element is much shortened.

In the fore foot of *Camptosaurus*, there were five functional digits, the first being flexible, and nearly parallel with the second, thus differing from the divergent, stiff thumb of *Iguanodon*. The hind feet had each three functional digits only, the first being rudimentary, and the fifth entirely wanting, as shown in Plate VI. The entire skeleton of *Camptosaurus* was proportionately more slender and delicately formed than that of *Iguanodon*, although the habits and mode of life of these two herbivorous Dinosaurs were doubtless very similar.

The type specimen of *Camptosaurus dispar*, used as the basis of the present restoration, is from the *Atlantosaurus* beds of the upper Jurassic of Wyoming. This species and other allied forms will be described in full in an illustrated memoir now in preparation by the writer for the United States Geological Survey. The present restoration is reduced from a large drawing made for that volume.

New Haven, Conn., February 23, 1894.

* This name proved to be preoccupied, and *Camptosaurus* was substituted for it. This Journal, vol. xxix, p. 169, February, 1885.



Restoration of CAMPTOSAURUS DISPAR, Marsh. One-thirtieth natural size.

